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Carpenter, Polly; Hall, George R.

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ABSTRACT
This volume presents conclusions and implications derived from five cities' experience with performance contracting in education: Norfolk, Virginia; Texarkana, Arkansas (with Liberty-Eylau, Texas); Gary, Indiana, Gilroy, California; and Grand Rapids, Michigan. The five case studies cover eight programs in 15 schools. While each study is treated in a self-contained report, it has also been part of a coordinated investigation of more than 20 programs conducted from 1969 to 1971. This volume begins with a brief description of Rand's field study. Implications are then discussed under seven headings: instructional processes, cognitive growth, resource requirements, evaluation, program management, returns to contractors, and the major advantages and disadvantages of performance contracting. Conclusions include: (1) Individualized instruction was the goal of all programs; (2) The performance contracts, in most cases, produced respectable gains on standardized achievement tests; (3) Costs of programs vary widely; (4) Performance contracting fostered a healthy emphasis on the student and his learning as a measure of program success; (5) Performance contracting is proving to be a useful research and development tool; (6) This contracting has not generated large profits so far; (7)Performance contracting facilitates the introduction of radical change in education; (8) Some programs have been so complex that management has been severely hampered. For related documents, see ED 056 248 through ED 056 252. (Author/CK)

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CASE STUDIES IN EDUCATIONAL PERFORMANCE CONTRACTING

Conclusions and Implications

Rand
SANTA MONICA, CA. 90406

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Polly Carpenter
George R. Hall

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PREFACE

This Report is a product of Rand's study of performance contracting in education. The study is sponsored by the Assistant Secretary for Planning and Evaluation, U.S. Department of Health, Education and Welfare, under Contract No. HEW-OS-70-156.

Case Studies in Educational Performance Contracting comprises six volumes. Each is a self-contained study; together they provide a multifaceted view of performance contracting. The six volumes are:

1. R-900/1-HEW, *Conclusions and Implications,* by P. Carpenter and G. R. Hall
2. R-900/2-HEW, *Norfolk, Virginia,* by P. Carpenter
3. R-900/3-HEW, *Texarkana, Arkansas and Liberty-Eylau, Texas,* by P. Carpenter, A. W. Chalfant, and G. R. Hall
4. R-900/4-HEW, *Gary, Indiana,* by G. R. Hall and M. L. Rapp
5. R-900/5-HEW, *Gilroy, California,* by M. L. Rapp and G. R. Hall
6. R-900/6-HEW, *Grand Rapids, Michigan,* by G. C. Sumner

This study is the second of three Rand Reports on the subject. The first Report was J. P. Stucker and G. R. Hall, *The Performance Contracting Concept in Education,* The Rand Corporation, R-699/1-HEW, May 1971. The third Report will be a performance contracting guide intended for use by educational officials.

SUMMARY

This volume presents conclusions and implications derived from five cities' experience with performance contracting in education: Norfolk, Virginia; Texarkana, Arkansas (with Liberty-Eylau, Texas); Gary, Indiana; Gilroy, California; and Grand Rapids, Michigan. The five case studies cover eight programs in 15 schools. While each study is treated in a self-contained Report, it has also been part of our coordinated investigation of more than 20 programs conducted from 1969 to 1971.

This volume begins with a brief description of Rand's field study. Implications are then discussed under seven headings: instructional processes, cognitive growth, resource requirements, evaluation, program management returns to contractors, and the major advantages and disadvantages of performance contracting.

INSTRUCTIONAL PROCESSES

We have arrived at five conclusions concerning the influence of performance contracting on instructional processes:

- Individualized instruction was the goal of all programs.
- Because the programs focused on the disadvantaged, there was an emphasis on basic skills and considerable use of programmed materials. There were concomitant problems in providing for abler students. Programs will continue to be skill-

oriented, because of the stress on remedial training and the lack of consensus about the objectives of instruction outside of the simple cognitive skill areas.

- There was no evidence of dehumanization; there was some evidence of the reverse.
- Performance contracting programs have been and will probably continue to be developmental efforts rather than applications of off-the-shelf systems.
- Performance contracting was an educational change agent in the programs we observed.

COGNITIVE GROWTH

We have drawn four conclusions about cognitive growth (roughly speaking, growth in intellectual capabilities):

- The performance contracts did not produce dramatic gains on standardized achievement tests, but in most instances gains were respectable.
- The performance contracting movement has focused attention on the problems associated with gain scores on standardized achievement tests.
- Much more work needs to be done on criterion-referenced tests before their results can be interpreted meaningfully.
- Performance contracting has demonstrated that decisionmakers responsible for passing judgment on program effectiveness must become more involved in choosing instruments that will measure that effectiveness.

RESOURCE REQUIREMENTS

Costs of the programs were analyzed by means of a model that yields comparable replication costs—that is, costs derived from a single set of prices for resource units. Three conclusions were drawn:

- Comparable replication costs of performance contracting programs vary widely. In the Rand sample, per-student, per-subject cost varied as much as 80 percent.
- Performance contracting programs cost more than conventional instruction. This is to be expected, since their purpose is to make up for the educational disadvan-

tages of target students.

- Performance contracting programs cost about the same as (or less than) typical remedial programs funded under Title I of the Elementary and Secondary Education Act. This is because the performance contracting programs substitute aides, materials, and equipment for highly trained and highly paid special teachers.
- The important consideration, however, is not cost-per-student but cost-effectiveness. Unless future performance contracting programs achieve higher cognitive gains than past programs have, they will have to be justified on the basis of ancillary benefits such as curriculum development potentials.

EVALUATION

Four major points concern the evaluation of the programs:

- Performance contracting fostered a healthy emphasis on the student and his learning as a measure of program success.
- The requirement for maintaining the integrity of the validation of scores on achievement tests sometimes made it difficult to use evaluation data for program improvement.
- Evaluation designs were often haphazard or nonexistent.
- Data needed for thorough evaluations were usually inaccessible or unavailable.

PROGRAM MANAGEMENT

The section on program management considers six points:

- Performance contracting is proving to be a useful research and development tool. People who are not a permanent part of the school system seem to be freer to implement radical changes in the classroom than are regular school personnel.
- A respected and influential "sponsor" within the school district is a great help in overcoming inherent frictions and impediments to change. To assure that changes are permanent and that they expand beyond isolated programs will require continued high levels of sustained effort by the Local Educational Agency (LEA).
- Flexibility is essential in program organization and management, since con-

siderable program development will take place. Multiyear programs have advantages over single-year programs for this reason.

- Performance contracting programs impose special tasks of management and coordination not only on contractors but on the schools' administrative personnel. The complexity of some programs has exacerbated these problems. School administrators must be prepared to face legal and labor disputes. Most of these can be resolved, but there are two potential areas for serious conflict. One is the requirement for public control of *all* school programs. The other is teacher opposition to merit pay.
- It seems essential that local teachers be involved in program design and administration.
- Little effort was made in most programs to inform parents about the programs or to involve them. Many parents were confused by or hostile to some aspects of some programs.

RETURNS TO CONTRACTORS

With regard to the returns to contractors, four conclusions were reached:

- Performance contracting does not seem to have generated large profits so far.
- Performance contracting has generated some follow-on programs, only some of which tie fees to student achievement.
- Established contractors tend to prefer other arrangements to performance contracting, such as consultantships. Performance contractors will seek to convert performance contracts to other types of programs.
- Performance contracts have enabled a number of firms to break into new markets and to receive publicity for their goods and services.

MAJOR ADVANTAGES AND DISADVANTAGES

From the foregoing outline, we have identified three major advantages and three major disadvantages of educational performance contracting that can be inferred from the results of our field work. The following are the major advantages as we see them:

- Performance contracting facilitates the introduction of radical change in education.
- It places increased emphasis on accountability for student learning on the part of school administrators, contractors, and teachers.
- It has brought new Learning System Contractors (LSCs) into the educational field.

Three disadvantages also seem evident:

- Some performance contracting programs have been so complex that management has been severely hampered and costs have been unnecessarily high.
- Performance contracting programs will probably continue to be narrowly focused because of difficulties of defining objectives in subject areas other than those involving simple skills or, in some cases, difficulties in measuring the attainment of objectives.
- Performance contracting has exacerbated old problems to the point where they almost seem to be new ones. The most severe have been legal questions, issues of teacher status, difficulties in supplying the needed management skills, and especially, problems of test selection and administration.

ACKNOWLEDGMENTS

A special debt of gratitude is owed S. A. Haggart, who provided the conceptual framework and analysis for the discussion of resource requirements in Section IV. Our other colleagues on this field study effort, A. W. Chalfant, M. L. Rapp, and G. C. Sumner, also provided information and advice. G. H. Fisher, W. I. Harriss, and J. Pincus of Rand and Dr. J. Richard Harsch of Educational Testing Service made valuable comments and suggestions. S. H. Landa of Rand provided statistical and other assistance.

This study would not have been possible without the gracious cooperation of many school administrators and teachers in the five districts involved; a number of these people are acknowledged in the other volumes. At this point we would like to extend our general thanks to all who provided assistance.

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I. INTRODUCTION

THE RAND/HEW STUDY

The RAND/HEW study objective is to provide guidelines for decisionmakers in Local Educational Agencies (LEAs) helping them determine whether to enter into performance contracts and to use them effectively if they do. A fundamental tenet of the study has been that these guidelines must be developed from detailed analysis of actual programs; therefore, much of the research effort has been devoted to studying eight performance contracts involving seven learning system contractors (LSCs), 15 schools, and six school districts in five cities: Norfolk, Virginia; Texarkana, Arkansas (with Liberty-Eylau, Texas); Gary, Indiana; Gilroy, California; and Grand Rapids, Michigan. The purpose of this volume is *not* to evaluate or compare the specific contracting programs, as such, but to draw implications from these programs that may be of general use.

Initially, there was some thought that a single cross-district study format might be useful. As the planning in the various districts progressed, however, it rapidly became apparent that the projects would differ so much that this approach would be inappropriate. It was also apparent that some of the most instructive experiences —such as the dispute with the teachers' union in Gary—were specific to one or a few programs. Therefore, Rand designed a plan for a field study in depth of a small set

of programs, supplemented by a less intensive look at a larger group.[1] This volume summarizes Rand's field monitoring work with primary emphasis on the eight programs involved in the case studies.

THE FIVE CASE STUDIES

The sample was chosen to provide a diverse group of school districts and programs. Four geographic regions are represented: Southeast, North Central, South Central, and Far West—as shown in Fig. 1. The cities also vary widely in size of the total population and of the enrollment in public schools, as illustrated in Table 1. Both urban and rural areas are represented, as are black and Spanish-surname minority groups, as well as whites.

Table 2 presents some general features of the eight programs. Note that, unlike the usual demonstration program in education, each of the programs except for the one in Gilroy involved a relatively large number of students; each, except for the one in Gary, was limited to the skill areas of reading or reading and math, and only one (Gary) involved an entire school. One LSC was a subsidiary of a major textbook publisher, one was primarily an educational hardware firm, and the other five were curriculum and educational services firms. All were active in performance contracting elsewhere. Half the contracts were let by competitive bid and half by sole-source negotiation. Some of the programs entailed elaborate contractual arrangements, including management support contractors and contracted evaluations and audits. In others, all planning, management, and evaluation was done by school district personnel.

The Alpha Systems contract in Grand Rapids was part of the Office of Economic Opportunity's experiment in performance contracting that involved 20 programs throughout the country.[2] The much-publicized program in Texarkana during the

[1] The performance contracting activities of LEAs and state educational authorities (SEAs) have included, in addition to the above-mentioned programs: Alachua County, Fla.; Colorado programs (three in Denver area sponsored by SEA); Compton, Calif.; Flint, Mich.; Greenville, S.C.; Mesa, Ariz.; Muskegon, Mich.; Philadelphia, Pa.; Portland, Ore.; San Diego, Calif.; San Francisco, Calif.; Virginia programs (including activities of SEA); Yuba County, Calif.

[2] For further information, see T. K. Glennan, "OEO Experiments in Education," *Compact*, Vol. 5, No. 1, February 1971, pp. 3-5, or J. O. Wilson, "Statement Submitted for the Record on Performance Contracting Before the House Committee on Education and Labor," Office of Economic Opportunity, Washington, D.C., April 20, 1971 (mimeograph).

Fig. 1—The five case studies

1969-70 school year was included, as well as the 1970-71 program, the only program that included a turnkey component (an effort to transfer the contracted program to the regular school curriculum). The program in Gary was also one of the case studies; it was also highly publicized because a contractor operated an entire school, giving rise to difficulties with the teachers union and the state department of education.

Some of the significant features of the contracts themselves are displayed in Table 3. The performance guaranteed by the contractor was usually on the order of "one grade-level" gain in about a year of instruction.[3] LRA in Norfolk had the most

[3] BRL in Gary specified performance "at grade level" for students in the program for 3 years. For those in the program for less time, the goal is one grade-level gain per year.

Table 1

CHARACTERISTICS OF CASE-STUDY CITIES

City	1970 Population	1970 Public School Enrollment	Main Minority	Percent Minority	Economic Base
Gary	182,000	47,000	Black[a]	60	Manufacturing
Gilroy	11,250	5,000	Spanish surname	34	Agriculture
Grand Rapids	200,000	41,000	Black	20	Manufacturing
Norfolk	300,000	55,000	Black	30	U.S. Navy
Texarkana	60,000	14,000	Black	27	Manufacturing

[a]Also has a sizable Spanish-surname community.

ambitious objective: student gains of at least 1.7 grade levels by the end of the program. Criteria for student selection also varied from a very loose "all assigned by the LEA" to the complex specifications of the Dorsett and EDL programs in Texarkana. Evaluation designs ranged from the casual, in-house plans for the WLC programs in Grand Rapids and Gilroy to the elaborate evaluation plans for the EDL program in Texarkana involving independent evaluation contractors. Provisions for contract changes were specified in only half the programs, and the provisions in Texarkana/Dorsett were minimal. Provisions for turnkey programs received even less attention in all programs except Texarkana.

GENERAL FEATURES OF THE FIELD STUDIES

The Rand research team drew up a plan for the field studies at an early stage of the work. It included schedules of visits to the districts selected for research in depth, detailed lists of data to be collected, guides for classroom observation, and categories of people to be interviewed. The plan was kept flexible because it was anticipated that program-changes during the year would force changes in the study.

The field study was a team effort involving people from several professional

Table 2

GENERAL FEATURES OF THE EIGHT PROGRAMS

City	LSC[a]	Subjects	No. of Students (approx.)	Grades	Method of Contractor Selection[b]	Management Support Contractor	Independent Evaluation or Audit
Gary	BRL	All	850[c]	K-6	S	No	Yes
Gilroy	WLC	Reading, math	100	2-4	S	No	No
Grand Rapids	Alpha[d]	Reading, math	600	1-3, 7-9	C	Yes	Yes
	CMES	Reading, math	600	6-9	S	No	Yes
	WLC	Reading, math	400	1-6	S	No	No
Norfolk	LRA	Reading[e]	250	4-9	C	Yes	Yes
Texarkana	Dorsett (1969-70)	Reading, math	350	7-12	C	Yes	Yes
	EDL (1970-71)	Reading, math	285	7-12	C	Yes	Yes

[a]Contractor abbreviations: Alpha: Alpha Systems
BRL: Behavioral Research Laboratories
CMES: Combined Motivation and Educational Systems, Inc.
Dorsett: Dorsett Educational Systems, Inc.
EDL: Educational Development Laboratories, Inc.
LRA: Learning Research Associates
WLC: Westinghouse Learning Corporation

[b]C: competitive bid; S: sole source.

[c]The entire school.

[d]Part of the OEO's experiment in performance contracting.

[e]Part of a state-wide project sponsored by the Commonwealth of Virginia.

Table 3

SOME FEATURES OF THE EIGHT PROGRAMS

City and LSC	Purpose	Performance Specifications	Payment Based On	Student Selection Criteria	Contract Changes	Turnkey	Evaluation		
							Responsibility Of/ Selected By	Responsible For	Method
Gary, HRL	(1) Improve student achievement at no additional cost to district (2) Demonstrate advantage of changed learning system for entire school	(1) 3-year students: perform at national norm level by program end (2) Others: one grade level per year in program	Math and reading achievement	All students in school	May be initiated by LEA; require mutual agreement	Responsibility of contractor and LEA	(1) Independent evaluator paid by contractor/LEA (2) Auditor/LEA	(1) Evaluating design and testing (2) Computing LSC payment only	Standardized tests, reaction of students and parents, attendance, discipline records
Gilroy, WLC	Improvement in reading and math	One grade level increase per student per subject by year end	Math and reading achievement	All students assigned by LEA	Not mentioned	Nor mentioned	Not mentioned	Not mentioned	Not mentioned
Grand Rapids, Alpha	Improvement in reading and math	(1) Grades 1-3: at least 0.75 grade gain (2) Grades 7-9: at least one grade gain	Math and reading achievement	Students performing lowest in reading and math on standardized tests	May be initiated by contractor; require approval of project directors (LEA) and project manager (OEO)	Not mentioned	Independent evaluator/OEO	Test administration, certifying program objectives; evaluating noncognitive aspects	Pre-, post-tests, questionnaires
Grand Rapids, CMES	Improvement in reading and math	No minimum gain stated; CMES reimbursed roughly proportional to gain	Math and reading achievement	Students performing lowest in mutually acceptable standardized tests	Not mentioned	Responsibility of contractor and LEA	(1) Independent evaluator/LEA (2) Testing company/contractor	(1) Validating grade gains (2) Miscellaneous evaluation	Pre-, post-tests
Grand Rapids, WLC	Improvement in reading and math	Students gain at least one grade level by year end	Math and reading achievement	All assigned by LEA (eventually the entire student bodies)	Not mentioned	Not mentioned	Not mentioned	Not mentioned	Not mentioned
Norfolk, LRA	Improve reading skills of students	(1) Students gain at least 1.7 grade levels (2) Each student passes 80% of his performance objectives	Gain scores on standardized reading tests (75%); interim tests of performance objectives (25%)	Grade level deficiency in reading determined by standardized tests	May be initiated by contractor; require approval of State Dept. of Education, LEA, Management Support Group	Word only mentioned	Independent evaluator/ State Dept. of Education	Certifying student achievement for contractor payment	Standardized pre-, post-tests; interim tests of performance objectives
Texarkana, Dorsett	Remove educational deficiencies of potential dropouts	One grade level increase per student per subject in 168 hours of instruction or less	Gain scores on standardized tests of math and reading	Students deficient in reading and math at least two grade levels but with an IQ of at least 75	May be initiated by LEA "from time to time"	Responsibility of LEA	(1) Independent evaluator/LEA (2) Independent auditor/LEA	(1) Evaluating design, management reports, test scoring (2) Critique evaluation (design, procedure), validating scores	(1) Observation, reports, meetings, manual scoring (2) Observation, review of reports, sample scoring
Texarkana, EDL	(1) Program dropout rate of 5% or less (2) Increase academic achievement of educationally deficient students (3) Increase cost effectiveness of instructional program	(1) Each student gains at least one grade level (2) Each student passes 75% of performance criterion-referenced items (3) Costs of instructional system decrease per student	(1) Math and reading scores on standard tests (75%) (2) Criterion reference measure (25%)	(1) An IQ of at least 75 (2) Students in Phase I who did not gain one grade level (3) 7-12 grade students with at least a two-level grade deficiency in either reading or math	Not mentioned	Reponsibility of LEA	Independent evaluator, independent auditor/LEA	Same as above, plus assuring test integrity	Same as above, plus evaluator reviews materials

disciplines: education, psychology, economics, business administration, and system analysis. In essence, however, a single team member was responsible for the field study in a given city. This fostered a continuity of interaction between the Rand team member with primary responsibility and the school district and contractor personnel. It also assured a continuity of study effort.

The researchers assigned to each district used the master plan to develop a localized plan that reflected special features of the LEA and LSC, and the educational or political issues that appeared to be of the widest general interest. Naturally, the studies also reflect the professional backgrounds and interests of the researchers. In short, each case study, reported in a separate volume of this series, has unique features. While all the case studies reflect a common or basic plan, no attempt was made to homogenize them nor to maneuver the team members into a consensus concerning conclusions and implications.

PLAN OF THIS VOLUME

This volume presents implications that are common to the individual studies. The objective is not to pass judgment on each of the programs as such, but to draw from them useful information on performance contracting as a technique for organizing instructional programs. These implications are discussed under the following headings: instructional processes, measuring cognitive achievement, evaluation, resource requirements, program management, and returns to the contractors. The final section sums up the team's views of the major advantages and disadvantages of performance contracting.

II. INSTRUCTIONAL PROCESSES

Two intertwined hopes have supplied much of the impetus for performance contracting. One has been that it might serve as an instrument for change, stimulating innovations in education, which has lagged behind most other fields in the rate of technological change. Central to this hope is the concept of turnkeying cost-effective new educational processes. Performance contractors, it has been theorized, would be able to demonstrate their systems under field conditions.[4] A school system with an effective performance contract could later enter a turnkey phase, in which it took over the new instructional system for its own use.

The second hope has been that performance contracting would help solve America's compensatory education problem. School officials, particularly since the Coleman Report,[5] have been under great pressure to raise academic achievement, especially among disadvantaged socioeconomic groups whose members often leave schools with severe educational handicaps. Public attention has been focused on cognitive achievement as measured by standardized test scores. Conventional remedial education having had a disappointingly low impact on these scores, per-

[4] On the turnkey concept see Education Turnkey Systems, Inc., *Performance Contracting in Education*, Research Press, Champaign, Illinois, 1970; L. M. Lessinger, *Every Kid A Winner: Accountability in Education*, Simon and Schuster, New York, 1970.

[5] J. E. Coleman, et al., *Equality of Educational Opportunity*, U.S. Office of Education, Washington, D.C., 1966.

formance contracting has been looked to as the possible answer. Its potential remedial powers could work either directly or indirectly. Directly, contractors claim to possess proven instructional systems that, if properly used, are capable of producing dramatic increases in achievement scores. Indeed, the contractors have been so sure of results that they have been willing to "guarantee" substantial improvements in standardized test scores. Harassed public school administrators find contractors' offers to "do something" about low-achieving students most appealing.

Indirectly, it is argued, performance contracting facilitates the introduction of materials and instructional methods better suited for those students who now score poorly on achievement tests. Perhaps, the reasoning goes, low achievement on standardized tests is the fault of using conventional textbooks and teaching methods designed for middle-class children but bordering on the irrelevant for lower socioeconomic groups. If so, it follows that new equipment, materials, and incentives are needed for teachers or students. The problem is how to put effective new systems into use.

This section examines the impact of performance contracting on instructional processes. Since the subject is explored in detail in several of the case studies, it will be merely summarized here. The next section considers the impact of performance contracting on cognitive achievement.

Despite the problems of implementing change in the public schools and the frequently virulent opposition to performance contracting, it has succeeded in bringing about change. For several reasons, however, the concept has lost almost all of its apparent simplicity in application. First, the programs in our sample of eight were development efforts, rather than mere transplants of fully developed "learning systems." In every case, substantial revisions were needed as the program progressed. Curricula had to be changed because the student populations differed from those the instructional programs had been designed for; lines of authority and responsibility had to be adjusted to achieve harmonious relationships among the LEA, teachers, and parents or other involved parties; schedules had to be revised because students needed more (or less) time with the program than had originally been estimated; students did not respond as expected to motivational techniques; teachers who could not cope with the changed instructional process had to be replaced. It should not be surprising that an instructional program would need to be revised, sometimes radically, when put to use in a new school system. LEAs differ widely not only in the needs of their students but in the ability of the school system to support any particular program. A program must be adaptable to a wide range of many variables if it is to be of general use. Currently, at least, it would be naive

to believe that an LSC could install a useful, completely prepackaged program in an unfamiliar school district.

Because the range of capability of the students in most programs was fairly wide, and because the contractors wished to make full use of each student's time, the programs were all built around the concept of individualized instruction. Moreover, because the contractors wished to demonstrate efficient instruction, materials or equipment that fostered self-instruction were used. The basic approach, then, was to determine what each student did and did not know about the subject of instruction (diagnosis) and then to assign materials from the instructional program to teach him what he did not know (prescription). Programs suffered, of course, when the diagnostic/prescriptive materials were inappropriate for the student population or, worse yet, when they were not all available from the outset of the program. In programs with a broad range of student capabilities, some contractors were hard put to provide enough variety to meet the needs of students at the far ends of the distribution. Nevertheless, almost all programs had achieved a substantial degree of individualization by the year's end.

To facilitate self-instruction, programmed materials were extensively used. Some students found these dull, but many found them exciting and took a greater interest in school. These materials seemed to appeal more to students at the lower levels of academic sophistication, however—that is, at the lower ages and grades or the lower achievement levels. This may have been as much the fault of the *way* in which the materials were programmed as it was of the fact that they *were* programmed. After all, programmed materials that challenge and excite the bright student have been written.

Some, but not most, of the programs featured teaching machines. Of the eight programs studied, two (Dorsett and EDL in Texarkana) were very machine-centered. CMES (Grand Rapids) relied heavily on machines, but also used supplementary materials. WLC (Gilroy and Grand Rapids) and LRA (Norfolk) used tape recorders along with a wide variety of paper-and-pencil materials. BRL (Gary) had a paper-and-pencil system, although there was a modest reading laboratory using some equipment during the morning at Banneker school. Alpha (Grand Rapids) also took a nonmachine approach. (See Table 2 for the full forms of abbreviated names.)

Because self-instruction was the heart of the instructional program, several contracts featured special incentives for students. Extrinsic motivators for accomplishing assigned learning tasks were used in the Alpha, WLC, and Dorsett programs. CMES allowed students time in reinforcement centers and spent a substantial fraction of instructional time working directly on students' self-images and

goals. LRA used special rewards only for student-initiated outside reading, arguing that academic success provides its own rewards and incentives. BRL and EDL made no use of special incentives.

All programs aimed at teaching specific skills, primarily reading and mathematics. This was a natural consequence of using scores on achievement tests in reading and math as a measure of the quality of education, because of the relative ease with which desirable skills in these areas may be identified and assessed. LSCs believed their systems were effective enough that they could demonstrate marked improvement in student learning in the skills areas. Even though the Gary program involved subjects other than reading and mathematics, payments to BRL were based on student scores in reading and mathematics, and the curriculum emphasized these subjects. The emphasis on testable skills has been criticised by some. This criticism is probably justified if we are speaking of students who already have some mastery of the basic skills; it seems less reasonable for students who do not. Some students in some of the programs could not read at all, for example.

There was concern that performance contracting would be "dehumanizing"—that is, it would force the student into a mechanized environment in which he would produce to satisfy the profit motive of the contractor. We could find no evidence that it was, and did find some significant evidence of the reverse. First, the individualized approach of most systems required that the student accept greater personal responsibility for his activities. It has not always been easy to foster the necessary self-reliance, but when students do take the initiative for their own learning they seem to develop more maturity and respect for themselves and others. The contrast in this respect with students in regular classrooms was apparent in several programs.

Secondly, individualization and programmed instruction led to classroom reorganization, with less of the "teacher at the head of the class" syndrome. Teachers and pupils tended to interact more informally, in a more warmly personal way. This easy informality was even more readily attained in the many programs that had aides who handled routine matters and in some cases instruction. Contractors deliberately fostered the informal approach and strove to stimulate enthusiasm because they were convinced that unhappy students do not learn. BRL in Gary tried to promote what it termed a "more humane" atmosphere because it thought it would lead to better academic performance, but was hampered by parental dislike of "permissiveness."

Teachers in Gilroy told us they disapproved of turning the teacher into a diagnostician and curriculum manager and decreasing her role in the materials-teacher-student chain. We found the WLC center personnel providing some tutoring on a

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one-to-one or small-group basis when they felt that certain students would benefit from a more personal approach. The organizational format of the program permitted such an approach.

To repeat, then, we discovered no real evidence of dehumanization in the programs we studied, and have seen some evidence of the reverse.[6] In sum:

- Individualized instruction was the goal of all programs.
- Because the programs focused on the disadvantaged, there was an emphasis on basic skills and considerable use of programmed materials. There were concomitant problems in providing for abler students. Programs will continue to be skill-oriented, because of the stress on remedial training and the lack of consensus about the objectives of instruction outside of the simple cognitive skill areas.
- There was no evidence of dehumanization; there was some evidence of the reverse.
- Performance contracting programs have been and will probably continue to be developmental efforts rather than applications of off-the-shelf systems.
- Performance contracting was an educational change agent in the programs we observed.

[6] In the Texarkana program, many students apparently felt they had been relegated to "dummy classes"—a stigma often attached to remedial programs. Unfortunate as this stigma is (and certainly off the mark in the case of Texarkana), it can scarcely be equated with dehumanization.

III. COGNITIVE ACHIEVEMENT IN PERFORMANCE CONTRACTING PROGRAMS

To date, performance contracts have been covenants between LEAs and LSCs whereby the latter are compensated for their services largely on the basis of students' cognitive growth as measured by standardized tests. The measured gains for the programs in the sample are summarized in Table 4.

The letters "NR" in Table 4 stand for "not released." In the Texarkana-Dorsett case, the two parties are negotiating a settlement and litigation is likely. Final results will not be released until the matter is settled. Even then, according to the evaluator and auditor, the validity of the statistical data has been nullified by "teaching to the test." In the other programs the results will be available when they have been checked and rechecked and all financial claims involving them have been resolved. Educators are used to prompt release of achievement-test features. Caution and delay in release of test scores in performance contracting programs is an inherent feature because of their legal significance.

The numbers in Table 4 are cognitive gains expressed in achievement-years as measured by standardized tests. A figure of 1.0 would represent one year's growth as measured by the difference between a pre- and post-test. While 1.0 is the average for all students, populations such as those involved in these programs more typically have yearly gains of around 0.5 to 0.7.

Before discussing the implications of these gain scores, we should note that only

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Table 4

MEAN GAINS ON STANDARDIZED TESTS

City	LSC	Test Used[a]	Mean Gains	Remarks
Gary	BRL	MAT	1.7/1.7	Reading/math, 1st grade
	BRL	MAT	0.7/1.2	Reading/math, grades 2-6
Gilroy	WLC	SAT	0.6	Reading--for contract payment
	WLC	SAT	0.8	Math--for contract payment
	WLC	MAT (Reading)	0.6	Regular district test
Grand Rapids	Alpha	Various	NR[b]	Test identification not released by OEO. Three tests used.
	CMES	EDS	1.2/1.0[c]	Reading/math
	WLC	MAT	0.7[c]	Reading/math
	WLC	MAT	0.6[c]	Math
Norfolk	LRA	Various[d]	0.1	5th grade
	LRA	Various	0.5	7th and 9th grades
Texarkana	Dorsett	ITBS	NR	Arkansas
	Dorsett	SRA	NR	Texas
	EDL	ITBS	0.5/0.3	Arkansas and Texas, reading/math, grades 6-12

[a]Test abbreviations: MAT: Metropolitan Achievement Test
SAT: Stanford Achievement Test
EDS: Educational Development Series, Scholastic Testing Service
ITBS: Iowa Test of Basic Skills
SRA: Science Research Associates Achievement Tests

[b]NR: data not released.

[c]Mean gains for those students who attended at least 150 days and for whom pre- and post-test scores are available.

[d]Three tests used at each grade, chosen from SAT, MAT, ITBS, California Achievement, and Stanford Reading Achievement. Means computed only for students who took both a pre-test and a post-test.

the data for Gilroy and for the fifth grade in Norfolk represent gains by the majority of the students in the program. The CMES and Norfolk junior high data represent gains for only about a third of the students, because of difficulties in obtaining both pre- and post-tests for students and high absence rates in these grades. The gains by other students in the CMES program are not known to us; the Norfolk formula for payment to LRA (computed from averages of all pre- and post-test scores) attributed a mean gain of 0.9 to the students at the junior high level. The WLC program in Grand Rapids was expanded at midyear; therefore, the gain scores reported here represent only a third of the students (probably the less able students) ultimately in that program.

The gains listed in Table 4 are generally respectable but, except for Gary and CMES in Grand Rapids, they were below contractor expectations. There were expectations, for example, that students would gain two grade levels in a single year. In some cases, such as the LRA program for the fifth grade in Norfolk and the EDL program in Texarkana, the gain scores are poorer than those the schools had been registering prior to performance contracting. In other cases, such as the WLC program in Grand Rapids and the LRA program at the junior high level in Norfolk, the scores were about the same. In other programs the picture has been more complex. In Gilroy, for example, the WLC center students in grades 3 and 4 did better than other Title I students in reading; in grade 3 mathematics, Title I students did better than the WLC program students, but in grade 4 the WLC students did better.

In view of this picture, the gains in Gary are unusually good. We do not think this is attributable to the fact that an entire school was used, as the LRA program encompassed almost the entire fourth through sixth grades in Norfolk. We also do not think that the students at Banneker were significantly more able than those in other programs, although their pre-test scores were somewhat better than those in, say, the Grand Rapids program. The Gary program was different from the others in two important respects, however. First, because BRL was responsible for the entire curriculum, it could concentrate heavily on reading and math. In fact, almost all of the first semester was spent in teaching these subjects. Second, parents of Banneker students evidenced much more involvement with their children's learning than did parents elsewhere. Overall, then, the LSCs performed well but did not achieve the striking gains—at least, as measured by standardized tests—expected by those educators who had looked to performance contracting as the golden key to compensatory education.

Why have the achieved gains for 1970-71 been so different from what was predicted? There are three possibilities, all of them probably correct in part:

1. The LSCs provided instruction that was no more effective than that in conventional classrooms.
2. Because the programs were developmental, they could not realize their full effectiveness in one year.
3. The standardized tests did not accurately measure the results of the performance contracting programs.

The simplest explanation is the first. To begin with, both contractors and LEA officials often set overly ambitious goals; it is no small task, for example, to inspire a two-grade-level gain in a single year among students whose previous rate of growth was about half a grade level. But at any rate, the novelty of the systems lay typically in the organization of the use of time and materials; the materials and techniques were usually well known. Thus, one could argue that the cognitive test scores merely reflect that there was little difference between conventional educational programs and performance contracting programs.

This explanation may be part of the story but we think it is only a part. Our observations lead us to take seriously the other two alternative explanations listed above.

One is that 1970-71 was the developmental year for most of these systems, and many problems had to be overcome. It is conceivable that future performance contracting programs will show more substantial gains. We observed many developmental problems. For example, some of the programs were not well matched to the students; some ran into logistic difficulties with facilities and personnel; most slighted in-service training; often materials, diagnostic instruments, or the like, were excessively late in reaching the teachers' hands; some programs were afflicted with high turnover of students, absences, scheduling problems, and dropouts; many unmotivated students remained unmotivated; some students did not function well in an independent learning situation; some teachers were inept; some LSCs had more difficulty than they had anticipated in keeping their programs on the prescribed track; and some programs were poorly designed.

Not all these problems were solved in 1970-71; some will likely never be solved. A significant number, however, were addressed and it is conceivable that cognitive gains may be higher when teachers and administrators can turn their full attention to operational rather than developmental tasks.

A third explanation of 1970-71 achievement scores is more basic.[7] Some com-

[7] This discussion has profited from conferences with Dr. Richard Harsch of Educational Testing Service.

mentators question whether standardized achievement tests can accurately gauge the impact of performance contracting (or any other special program) on an individual student's cognitive growth.

There has been a growing emphasis on the use of student scores on standardized achievement tests as a measure of the quality of education. Monies granted under Title I of the Elementary and Secondary Education Act carry with them the requirement for evaluation of the effectiveness with which they have been used. State governments have followed suit. Frequently, legislation appropriating special funds for education will specify that project successes be evaluated on the basis of student scores on standardized tests.

This trend is a refreshing change from the traditional evaluation, which often relied exclusively on reporting whether or not the participants "liked" the project. The use of standardized tests for evaluation also places emphasis on the ultimate consumer of education, the student himself.

Despite the attractive features of using standardized test scores as a measure of educational output, a number of critics fear they may be misused. In particular, the use of achievement test scores as a basis for contractor payment has raised a number of objections.

The basic problem is that such tests were not designed to measure the effects of short-run instruction, but to serve as predictive tools.[8] Given a student's score on a standardized test, one can predict with some confidence what his future performance will be in pertinent academic fields. The tests were not designed to distinguish the contribution of "good teaching" to success from that of other influences, such as the students' home environment.

One serious aspect of this problem is that the sorts of behavior a program seeks to affect are likely to differ in number and possibly in kind from the behaviors tested by the usual instruments. For this reason, standardized tests may not adequately measure the results of short-run instructional programs. This is particularly likely if a program concentrates on a relatively narrow set of skills (such as word attack) that may provide the basis for student mastery of more general skills (such as reading comprehension). In such an instance, it is unrealistic to expect standardized tests to measure the effectiveness of instruction. One may take issue with the program design, however, if it is this narrow; but even if the program is not narrowly restricted, it is still likely that no standardized test will exactly match its content

[8] Robert E. Stake, "Testing Hazards in Performance Contracting," *Phi Delta Kappan*, June 1971, pp. 583-589.

and emphasis.[9] Stake has suggested that one way around this difficulty is to draw selectively from items on a standardized test in order to match the program content, but this procedure sacrifices the very feature of standardized tests that makes them so useful—the existence of norms.

Even apart from this basic problem that the measurement tool in current use is not well adapted to the task of evaluating the contribution of various instruction inputs to student-learning outcomes, standardized achievement test scores as a measure of program success have been attacked on other grounds. One problem that has received much academic attention is unreliability and bias in computations of achievement change.[10] The usual discussion dwells on the possibility that change-score computations might indicate more learning than actually took place; we believe they might also indicate less.

The disadvantages of using standardized norm-referenced tests to measure the success of performance contracting programs have inspired attempts to construct new tests specific to the programs they will measure. These tests are often referred to as "mastery" or "criterion-referenced" tests because student performance is judged on the basis of criteria in performing a specific task in relation to a defined population. Two of the programs in the study (Norfolk and Texarkana, 1970-71) incorporated this feature, but the word was easier than the deed. No one had anticipated the tremendous effort that would be required to construct and administer the tests. Typically, questions arrived later than the contract had specified, and test administrators had to resort to sampling of both items and students to keep resources required for testing within manageable bounds. The other difficulty was the questionable reliability of some of the test items, but this is a common problem.

In spite of these problems, the Norfolk evaluator was able to perform four separate administrations of criterion-referenced tests. Since in two of them at least 90 percent of the students met the criteria,[11] the Norfolk program appears to have

[9] Ibid.

[10] Ibid.; L. J. Cronbach and L. Furby, "How We Should Measure 'Change' or Should We?" *Psychological Bulletin*, Vol. 74, No. 1, 1970, pp. 68-80; Quinn McNemar, "On Growth Measurement," *Educational and Psychological Measurement*, Vol. 18, No. 1, 1958, pp. 47-55; Frederic M. Lord, "Elementary Models for Measuring Change," *Problems in Measuring Change*, Chester W. Harris (ed.), University of Wisconsin Press, 1967, pp. 21-80; Roger T. Lennon, "Accountability and Performance Contracting," address delivered to the American Educational Research Association, February 5, 1971 (mimeograph); Robert L. Thorndike and Elizabeth Hagen, *Measurement and Evaluation in Psychology and Education*, 2d ed., John Wiley & Sons, New York, 1961.

[11] See Vol. 2 of this study.

been effective in teaching what it was designed to teach. The difficulty, as indicated by the gain scores in Table 4, is that there seems to be a weak relation (at least at the elementary level) between the program content and the content of the standardized tests. In such a case, the school system must decide which of the results is the more significant from the point of view of the needs of the student population.

We wish to emphasize that the problem of obtaining adequate measurement instruments for performance contracting programs is only one of three possible explanations for the 1970-71 scores. We have dwelt on testing at greater length because we believe that one of the major outcomes of performance contracting in 1970-71 has been to focus public attention on educational measurement problems. These are old problems but the use of test scores to compute contractor payments has publicized the need for powerful and accurate evaluation instruments. We also believe that the 1970-71 performance contracting experience indicates that this is a fertile field for educational research.

In sum:

- The performance contracts during 1970-71, the first real year of performance contracting, did not produce dramatic gains on standardized achievement tests, although in most instances gains were respectable.
- The performance-contracting movement has focused attention on the problems associated with gain scores on standardized achievement tests.
- Much more work needs to be done on criterion-referenced tests before their results can be interpreted meaningfully.
- Performance contracting has demonstrated that decisionmakers responsible for passing judgment on program effectiveness must become more involved in choosing the instruments that will measure that effectiveness.

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IV. RESOURCE REQUIREMENTS FOR INSTRUCTIONAL PROGRAMS

The actual costs of performance contracting programs are discussed in the case studies, Volumes 2 to 6. Such figures are of historical interest but they are not particularly helpful in answering two questions often asked about performance contracting programs. One is, how do the costs of the different programs compare? The other is, how do costs of performance contracting programs compare with costs of other types of instructional programs?

To address these questions, a Comparable Replication Cost model has been constructed.[12] This model uses the resources that would be required for an in-house replication of a given learning system. Second, the model holds factor-costs—cost per unit of resources—constant across all programs; that is, the same unit prices are used for each resource in all programs. For example, in the illustrations to be presented it is assumed that every elementary teacher is paid a salary of $12,000, and this figure is used in all programs. Actual salaries and other local prices of course differed widely among programs. Also, the actual programs required resources that would not be needed for an in-house replication. These considerations are important for determining what any given program might cost in any specific district, but are not useful for making general comparisons among programs.

[12] By S. A. Haggart. This section is derived from her resource analysis of performance contracting programs.

To compare programs we have computed the comparable replication cost for all programs except Gary, which encompassed an entire school. Table 5 gives the estimates, assuming:

- The same prices are paid for factors in each district.
- Classroom space is already available.
- Program direction is available from the central administration.
- Curriculum and materials have been developed.

Table 6 summarizes the resources involved, and Table 7 presents the data used to estimate the comparable replication costs. It should be noted that the costs are based on modules of a minimum group of students. That is, it is assumed that certain facilities are required to accommodate a certain number of students per instructional area per day. For example, in the Dorsett Texarkana program the module is 120 students, or 20 students per classroom for 6 hours per day. If the Dorsett program were to handle 150 students, for example, two units would be needed (not 1.25). If it were applied to 60 students, one unit (not 0.5) would be needed. In either case there would be underutilization.

The Comparable Replication Costs of the programs varied widely.[13] The range was from a low of $103 per student per subject in the CMES program in Grand Rapids to a high of $187 in the WLC program in Gilroy. These cost figures, not unexpectedly, reflect the intensity with which the different programs used teachers and aides.

The comparison between performance contracting programs and other types of programs is instructive. Tables 5 and 6 show two typical programs, one a remedial reading program in Norfolk and the other a regular reading and mathematics program in Grand Rapids. As should be expected, the cost per student per subject in the conventional Grand Rapids program is quite a bit less than that of the performance contracting programs—about half the Comparable Replication Cost of most programs. The Norfolk remedial reading program is much higher in cost—$248 compared with $187 for the most expensive performance contracting program. The Norfolk approach to compensatory education is very labor-intensive; other programs might use fewer teachers. Nonetheless, our observation is that, in general,

[13] Keep in mind that Comparable Replication Costs do not include many developmental and administrative costs actually incurred in performance contracting programs, and constant factor prices are assumed in all districts. They are not the actual costs any specific LEA or LSC would incur to implement a program.

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Table 5

COMPARABLE REPLICATION COSTS FOR SELECTED PROGRAM DATA

Item	Performance Contracting Programs						Other Programs	
	Texarkana Dorsett	Texarkana EDL	Grand Rapids CMES	Grand Rapids WLC	Gilroy WLC	Norfolk LRA/UEI	Norfolk Remedial	Grand Rapids Regular
Students and centers								
Number of students	350	285	515	150	103	250	1,000	525
Number of instructional centers	6	5	4[a]	1[b]	1[b]	2	17	5
Number of students/inst. center[c]	20	20	40/65[d]	50	50	25	10	30
Costs (in $)								
Acquisition cost	$ 92,400	$70,000	$120,000	$21,000	$22,000	$26,600	$ 31,000	$ 3,500
Operational cost	124,000	98,000	106,000	37,000	38,500	44,000	248,000	92,000
Operational cost/student	354	344	206	247	373	176	248	175
Operational cost/student/subject[e]	177	172	103	124	187	176	248	88

[a] In addition to the four centers, there was one reinforcement area.

[b] The instructional center is augmented by an activity area of equivalent size.

[c] The instructional center is the basic provisional unit for acquisition cost.

[d] 40 students per single center, 65 per double center.

[e] Reading and mathematics for all programs except Norfolk, LRA/UEI, and Norfolk, Remedial, both of which were for reading only.

Table 6

COMPARABLE REPLICATION COSTS FOR PERFORMANCE CONTRACTED PROGRAMS

(Costs in dollars)

Item	Performance Contracting Programs						Other Programs	
	Texarkana Dorsett	Texarkana EDL	Grand Rapids CMES	Grand Rapids WLC	Gilroy WLC	Norfolk LRA/UEI	Norfolk Remedial	Grand Rapids Regular
Acquisition Cost								
Facilities (remodel, furnish)								
Total program cost	30,000	25,000	20,000	7,500	7,500	10,000	--	--
(Cost/instructional area)	(5,000)	(5,000)	(5,000)	(3,750)	(3,750)	(5,000)	--	--
Equipment								
Total program cost	20,400	15,000	37,000	2,500	2,000	5,000	13,600	2,000
(Cost/instructional area)	(3,400)	(3,000)	(9,250)	(2,500)	(2,000)	(2,500)	(800)	(400)
Materials								
Total program cost	18,000	20,000	45,000	8,000	8,600	7,600	17,000	1,500
(Cost/instructional area)	(3,000)	(4,000)	(11,250)	(8,000)	(8,600)	(3,800)	(1,000)	(300)
Pre-service training	24,000	10,000	18,000	3,000	4,000	4,000	--	--
Total acquisition cost	92,400	70,000	120,000	21,000	22,100	26,600	30,600	3,500
Operational Cost								
Salaries (incl. fringe benefits)								
Teachers ($12,000/yr)	72,000	60,000	48,000	12,000	12,000	24,000	204,000	84,000
Paraprofessionals ($5,000/yr)	30,000	25,000	25,000	10,000	15,000	10,000	--	--
Other (variable)	--	--	--	--	--	--	--	--
Materials								
Program-related (10%)	1,800	2,000	4,500	800	860	760	1,700	150
Consumables (student)	3,500	2,850	5,000	1,500	1,030	2,500	5,000	5,250
Equipment								
Replacement	2,040	1,500	3,700	250	200	500	1,360	200
Maintenance	4,080	3,000	7,800	250	200	500	1,360	200
In-service training	6,000	--	6,400	2,400	2,400	2,400	--	--
Other Support								
Student diagnostic services	--	--	--	7,500[a]	5,000[a]	--	35,000	--
Student evaluation (testing)	3,500	2,850	5,000	1,500	1,000	2,500	--	2,500
Consultants ($100/day)	800	800	800	800	800	800	--	--
Total operational cost	123,720	98,000	106,200	37,000	38,490	43,960	248,420	92,300

[a]Remote diagnostic and prescriptive services.

Table 7

DATA USED IN COMPUTING COMPARABLE REPLICATION COSTS

(Costs in dollars)

Item	Performance Contracting Programs						Other Programs	
	Texarkana Dorsett	Texarkana EDL	Grand Rapids CMES	Grand Rapids WLC	Gilroy WLC	Norfolk LRA/UEI	Norfolk Remedial	Grand Rapids Regular
Equipment								
Cost/instructional area	3,400	3,000	9,250[a]	2,500	2,000	2,500	800	400
Number of instructional areas	6	5	4	1[b]	1[b]	2	17	5
Students/instructional area	20	20	40/65[c]	50	50	25	10	30
Replacement (10%)	2,040	1,500	3,700	250	200	500	1,360	200
Maintenance (10/20%)	4,080	3,000	7,800	250	200	500	1,360	200
Total cost	20,400	15,000	37,000	2,500	2,000	5,000	13,600	2,000
Materials								
Cost/instructional area	3,000	4,000	11,250[a]	8,000	8,600	3,800	1,000	300
Number of instructional areas	6	5	4	2	2	2	17	5
Consumables ($/student)	10	10	10	10	10	5	5	10
Total cost	18,000	20,000	45,000	8,000	8,600	7,600	17,000	1,500
Pre-service training								
Number of staff days[d]	120	50	90	15	20	20	--	--
Cost/day[e]	200	200	200	200	200	200	--	--
Total cost	24,000	10,000	18,000	3,000	4,000	4,000	--	--
In-service training								
Number of staff days	30	--	32	12	12	12	--	--
Cost/day	200	--	200	200	200	200	--	--
Total cost	6,000	--	6,400	2,400	2,400	2,400	--	--
Other support								
Student diagnostic services	--	--	--	50[f]	50[f]	--	35[g]	--
Student evaluation ($/student)	10	10	10	10	10	10	--	5
Consultants ($100/day)	800	800	800	800	800	800	--	--

[a] Cost per center includes reinforcement areas. Single-center cost slightly more than cost shown.

[b] One classroom area plus one activity area.

[c] 40 students per single center, 65 per double center.

[d] Includes time for paraprofessional training.

[e] Includes salary, materials, and training costs.

[f] Remote diagnostic and prescriptive services.

[g] Diagnostic center services.

performance contracting programs compare favorably on a cost-per-student basis with the usual remedial programs.

Cost-per-student is a misleading ratio, of course. One really needs some cost-effectiveness measure that takes outputs as well as inputs into account. Performance contracting programs should not really be compared with usual classrooms, because more effort must be expended to educate students who have had fewer academic advantages than their peers. But performance contracting programs compare favorably with the usual Title I programs, which have had disappointing showings so far.

One economic feature of performance contracting is brought out in the comparison of the resources in Tables 6 and 7. Compared with a regular program, performance contracting programs tend to spend less on certified teachers and more on paraprofessionals, materials, and equipment. In economic terms, there is a substitution of materials, capital, and less-trained labor for highly trained labor.

In short:

- Comparable replication costs of performance contracting programs vary widely. In the Rand sample, the variation was from $103/student/subject to $187/student/subject.
- Performance contracting programs cost more than conventional instruction. This is to be expected, since their purpose is to make up for the educational disadvantages of target students.
- Performance contracting programs cost about the same as (or less than) typical remedial programs funded under Title I. This is because the performance contracting programs substitute aides, materials, and equipment for highly trained and highly paid special teachers.
- The important consideration, however, is not cost-per-student but cost-effectiveness. Unless cognitive gains in future programs are higher than those to date, the extra cost of performance contracting programs will have to be justified on the basis of ancillary benefits such as curriculum development potentials.

V. EVALUATION

Most performance contracting programs, including most in the Rand sample, have had difficulties with evaluation. Four major points stand out:

- Performance contracting fostered a healthy emphasis on the student and his learning as a measure of the success of programs.
- The requirement for maintaining the integrity of the validation of scores on achievement tests sometimes made it difficult to use evaluation data for program improvement.
- Evaluation designs were often haphazard or nonexistent.
- Data needed for thorough evaluations were usually inaccessible or unavailable.

For the purpose of this discussion, "evaluation" is defined here to mean the determination of whether a program's objectives are being or have been achieved and determining the reasons for discrepancies between accomplishments and objectives.[14] Validation is a necessary part of any evaluation that uses quantitative

[14] Stufflebeam points out that educators usually define evaluation "... as the science of determining the extent to which objectives have been achieved." D. L. Stufflebeam, "Evaluation as Enlightenment for Decision Making," in W. B. Beatty (ed.), *Improving Educational Assessment and an Inventory of Measures of Affective Behavior,* National Educational Association, Washington, D.C., 1969, p. 47. However, evaluations that seem to have had an effect on decisionmaking about programs or the nature of the programs themselves have usually gone beyond mere computation of the discrepancies between goals and attainments and have tried to analyze the causes of the variance.

measures, such as achievement gains. We define "validation" as the measurement and certification of the quantitative magnitude of variables. In the performance contracting context, for example, achievement gains must be validated so that contractors can receive the monies owed to them. Evaluation in the sense of determining whether the objectives of the program were met is a related but broader task.

Because gain scores have been used to determine contractor payment, there has been a great emphasis on validating student scores on standardized achievement tests, or in some instances, scores on criterion-referenced tests. Evaluations have generally focused on such validation. Some evaluations have assessed noncognitive program outcomes such as student attitudes. Even so, as will be shortly discussed, this phase of performance contracting evaluations leaves much to be desired. In many programs, other relevant evaluation needs have been slighted.

The major gap has been provision for ongoing evaluation of educational processes to provide relevant managerial information. In some cases this need has not been perceived or has been regarded as falling outside the evaluation function. In one city in the Rand sample, the efforts to maintain test security and to assure that the evaluator remained rigorously objective meant that data that were needed during the program were not gathered or made available to the LEA.

Evaluations need not and should not be restricted to achievement-score validation. The 1970-71 Texarkana program provides a good example of an evaluation that served all the needs for information for validation, process evaluation, and decision-making. The evaluation was planned in detail before the contract was let, and the evaluator provided program administrators with information concerning program management, the instructional process, and student achievement throughout the development of the program. Probably the bitter experiences of the preceding year that amply demonstrated that mere validation is insufficient, coupled with the close proximity of a competent evaluator, led to this move.

In sum, the evaluation of a developmental program should provide two kinds of information: *(1) information that contributes to the improvement of the program as it develops,* and *(2) information that helps decisionmakers determine whether and how the program should be expanded in subsequent years.* [15] Such an evaluation must be carefully planned to assure that desired data will not be lost as the program progresses. Planning should involve not only the evaluator and LEA program director, but also building principals, those who will be responsible for making decisions

[15] Rarely are programs terminated, even if the evaluation is unfavorable. See R. A. Levine and A.P. Williams, *Making Evaluation Effective: A Guide,* The Rand Corporation, R-788-HEW/CMU, May 1971.

about program continuation, and others whose support for the program is needed for its success and future operation. Plans should explicitly provide for feedback to persons influential in program operation as the program develops.

It may be argued that if an evaluator is this closely associated with the development of a program, his objectivity will be questioned. This did not seem to be the case in Texarkana, however, where his objectivity appears to have been accepted. If there is such a concern, the use of an auditor in the program may help assure accuracy and honesty.

Turning to the second point, evaluation planning, the Rand sample runs the gamut from elaborate designs carefully coordinated with the other parts of the program (Texarkana, 1970-71) to sketchy evaluations with essentially no plans at all. In Gilroy, the formal data-gathering activities were limited to administering two standardized tests: the SAT as the basis for payment, and the MAT to maintain continuity with their previous Title I testing. Other evaluative data were gathered, however, because of the participation of Rand and of district employees working for degrees. The evaluation of the WLC program in Grand Rapids followed a similar course.

A somewhat more extensive effort was put forth to evaluate the CMES program in Grand Rapids, but again the evaluation consisted primarily of comparing pre- and post-test scores. An outside auditor verified testing procedures. An assistant principal, as part of a graduate course, designed an attitude questionnaire that was administered to about 50 pupils several times during the program, but we do not know whether these data were used by school officials.

The Alpha evaluator, Battelle Memorial Institute of Columbus, Ohio, was under contract to OEO. Battelle was to provide the district with achievement scores on pretests, interim tests, and post-tests. They conducted surveys of parent and student attitudes, but were not obliged to turn these data over to the district.

In Gary, the evaluator conducted the achievement testing and analyzed the results. He also prepared some questionnaires on student and parent attitudes. Process and managerial data, when they were obtained, had to be generated outside the evaluation process on an ad hoc basis.

The short shrift given most aspects of evaluation (particularly planning) in the programs we observed meant that most programs suffered from one or more of the following: tests were selected with little regard for their relation to the program; "control" groups (if any) were chosen on the basis of criteria different from those by which the treatment groups were selected; building principals had insufficient notice for scheduling students and rooms to accommodate test administrations; infor-

mation concerning outsiders' interest in and involvement with the program was gathered sporadically (if at all); records on disciplinary actions and other attitude indicators were not kept in usable form; data on IQ or district reading scores were collected without regard to the type of tests used; the evaluator did not observe actual classroom instruction; no evaluative feedback was provided during the program. If information on the attitudes toward the program of students, teachers, and others was gathered at all, it was by means of traditional questionnaires, which tend to suffer from the usual problems of biased sampling, unreliability, and invalidity. In short, only one program had the nearly constant watchdog mechanism needed to assess what was actually happening in the program. In no instances were trained observers used to monitor classroom activities in order to determine what, in fact, went on during the actual instruction.

The evaluators were hampered by the difficulties of gathering data in almost all school districts—difficulties we encountered during our own efforts. Data on students that are funadmental to almost any evaluation—IQ, scores on achievement tests, records of disciplinary actions, records of attendance at school or in specific classes, history of enrollments at schools in the district, date of birth, notes on membership in a minority group, indicators of socioeconomic status such as the occupation of the head of the household, identification of sex, and the like—all are scattered throughout the system in cumulative folders, various central files, teachers' record books, and so on. Retrieving these data requires so much time and effort that the task often was not even undertaken.

Some of the contractors attempted to gather other data peculiar to their programs. Elaborate forms were prepared on which classroom teachers or project directors were to record information concerning the time spent in use of materials and equipment, visits to learning centers, reasons for student dropout, or other information. In one instance, teachers were required to enter attendance at the learning center on four different forms. Duties of this nature were burdensome to busy teachers and administrators, and were often performed sporadically or given over to aides. The latter type of arrangement appeared to be the most economical and the most likely to result in accurate records.

There have been evaluation accomplishments as well as problems. We have dwelt on the problems because successful performance contracting programs require thorough evaluations. Evaluation can and should go beyond validation and provide the information needed for management decisionmaking, particularly decisions with respect to turnkeying new systems. Such evaluations are feasible, as the more outstanding evaluations to date have shown. Decision-relevant evaluations are

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a challenge and require significant expenditures. Considering the costs of performance contracting programs and their potential impacts, thorough decision-oriented evaluations have proven themselves to be well worth the effort and money, even though they may well be more expensive relative to program cost than the conventional 10 percent. For example, the Texarkana evaluation probably cost about 1/6 of the total program cost[16] in 1970-71.

[16] Including all program costs, not merely the payment to the contractor.

VI. PROGRAM MANAGEMENT

Performance contracting appears to be a useful R&D tool, particularly for smaller school districts without an abundance of resources for program development. Performance contracting is a useful way for a school district to explore new programs and to implement those that appear promising. People who are not a permanent part of the school system seem to be freer to implement radical changes in the classroom than are regular school personnel. Gary is the most obvious example of this, but the hardware-oriented systems in Texarkana were also significant departures from regular practice, as was the intensive CMES program.

One point that stands out in each of the five case studies is that the successes, failures, and problems associated with each program were intertwined with the personal characteristics of the people in charge and the intensity of their commitment to the program. True, this can be said of nearly all human endeavors, but it has an important implication for performance contracting. Any program that seeks to change the status quo has a hard task. A strong central figure who is personally committed to the success of the program can tip the balance between success and failure. Fortunately, committed people who were strong managers pushed the programs in all of our case studies. Some were superintendents or assistant superintendents of schools, some were program directors for the school system, and in at least one case the head of the Model Cities program was the spur. We have observed other programs languishing for lack of such a spur. If we were asked to name the single thing that an LEA or LSC could do to make a performance contract an

effective change agent we would answer: make sure that someone in the LEA's administration with ability, position, and respect adopts the program as his personal project.

In most districts, the need for extensive program changes had not been anticipated nor had the contract provisions and program administration been designed to accommodate such changes. In some instances, contracts had to be revised or amended part way through the program in order to adjust to unavoidable changes. These revisions always required considerable effort from most parties that had contractual arrangements associated with the program. Consequently, the contracts as they were written actually hampered the development effort.

The developmental nature of performance contracting programs implies that both LEAs and LSCs should build flexibility into programs and contracts. It also means that programs that last a single year or less labor under a great handicap, because most of the time must be spent on tailoring the system to the school district and its students. Multiyear projects, such as the four-year Gary program and the five-year Texarkana program, have considerable merit because they permit program redesign on the basis of the feedback from the first year or two.

Performance contracting programs have placed new demands upon school districts for management and coordination. Organizing a program, dealing with requests for proposals (RFPs), contract negotiations, fees, and other such features of many programs have required considerable effort from LEA officials, and often more time than had been anticipated.

The same generalization applies to the operational stage of the programs. Troubleshooting was required by both LEAs and LSCs. There was a great deal of effort by all involved in these programs to make them work. In part, this is a feature of conscientious program administration; but beyond that the special accountability feature of performance contracting is a built-in spur for administrators to examine continuously, assess the progress of the program, and make changes.

The difficulties of managing the developmental programs were heightened, in several cases, by a proliferation of contracts that fragmented responsibility and authority among several parties. The more elaborate the contractual arrangements were, the harder it was to maintain a clear picture of who was responsible for what, who was doing what, who had talked to whom, and so on. In other words, the familiar problems associated with an overextended span of control arose, and the school system's project director had to divert energies away from his primary responsibilities merely to provide liaison among the organizations involved. The solution to such situations—to develop the needed skills within the school system—will take time.

Legal questions about the conformity of performance contracts with state education codes and procurement regulations arose during 1970-71, but for the most part were left unresolved on the grounds that these were experimental programs. The same generalization applies to conflicts between performance contracts and LEA-union contracts or established teacher employment practices. In future years challengers are less likely to hold their fire; courts, state departments of education, and legislatures will no doubt be called upon to settle disputes.

An analysis of the legal and union issues that arose in Gary, and our studies elsewhere, indicate that most legal difficulties can be resolved with the expenditure of some effort. Performance contracts may encounter two matters of principle, however, that can create irremediable difficulties. The first is the issue of the cognizance and control of instruction. Unless the LEA firmly establishes and exercises its ultimate authority over a program, it is going to encounter legal difficulties that cannot be resolved short of restructuring the program in a way that conclusively nails down its authority.

The other major matter of principle involves union opposition to merit pay. Unions feel that differential staffing smacks of merit pay, although they have accepted it in a number of cities. Any special payments to teachers, however, are going to run into serious opposition, as the Grand Rapids experience with the Alpha program showed.

Teacher groups with collective bargaining agreements are likely to demand a voice in negotiating and structuring contracts on the basis that the performance contracts change conditions of work. (In 1970-71 their demands were not met in the cities in the Rand sample.) Also, programs that drastically change class sizes are likely to produce difficulties. Most such problems can be resolved but special incentives to teachers are likely to produce stalemate.[17]

Another lesson from the 1970-71 experience is the need to involve the teachers in design and planning for all phases of the program. Most contractors used local school system personnel to teach (all the programs in the Rand sample fall in this category).[18] The teachers, however, have had relatively little to say about the system at the start of the programs. In some cases the reason seems to have been lack of

[17] Unions seem reluctantly willing to accept the idea that teachers in performance contracting programs may have a greater income than that of the usual teacher if the difference is due to overtime as specified in the contract.

[18] In Texarkana the teachers were not on the LEA's payroll but they were eligible for credentials and were hired from a list that Texarkana maintained of qualified applicants for employment. Some were not yet credentialed.

time; in others it appears the LSC was proud of its system and believed that it was "teacher-proof." As it turned out, the LSC increasingly involved the teachers in planning and administration as the year went on, to the benefit of the programs.

In most programs, little effort was made to inform parents about the goals and techniques of the programs or to involve them in program planning, monitoring, or evaluation. Often parents were unaware that their children were in a special program; sometimes parents were confused by such features as nongraded report cards or were hostile to classroom "permissiveness." It is possible that the superficiality of most gestures toward parent involvement contributed to generally disappointing achievement scores.

In sum:

- Performance contracting is proving to be a useful research and development tool. People who are not a permanent part of the school system seem to be freer to implement radical changes in the classroom than are regular school personnel.
- A respected and influential "sponsor" within the school district is a great help in overcoming inherent frictions and impediments to change. To assure that changes are permanent and that they expand beyond isolated programs will require continued high levels of sustained LEA effort.
- Flexibility is essential in program organization and management, since considerable program development will take place. Multiyear programs have advantages over single-year programs for this reason.
- Performance contracting programs impose special tasks of management and coordination not only on contractors but on the schools' administrative personnel. The complexity of some programs has exacerbated these problems.
- School administrators must be prepared to face legal and labor disputes. Most of these can be resolved but there are two potential areas for serious conflict. One is the requirement for public control of *all* school programs. The other is teacher opposition to merit pay. Contractors must meet greater demands from school districts for responsibility for the goods and services they sell. The performance contract encourages active contractor participation in the program modifications that are generally required to adapt to the particular needs of a district.
- It seems essential that local teachers be involved in program design and administration.
- Little effort was made in most programs to inform parents of the programs or to involve them. Many parents were confused by or hostile to some aspects of some programs.

VII. RETURNS TO THE CONTRACTORS

Superficially, the primary return to the contractor in a performance contract is his payment for student achievement. Actually, it begins to appear that contractors are realizing much more significant gains in the form of follow-on contracts for materials and services for the coming school year, only some of which will be performance contracts. Norfolk has already bought LRA/UEI materials and equipment for eight more reading centers, with no performance contract involved; Texarkana will use EDL materials and equipment in a modification of the turnkey program, now referred to as individualized instruction. Even though WLC has phased out its School Operations Division, which ran last year's programs in Gilroy and Grand Rapids, the WLC centers under the 1970-71 contract in Grand Rapids will be operated under other auspices and three more centers will be in operation. Two were opened halfway through the 1970-71 school year at the teachers' instigation. Learning Unlimited will manage the centers in Grand Rapids at a flat rate per student. If Gilroy has a center it will be run by teachers.

Three of the programs will continue as performance contracts with the same contractors: BRL in Gary, because it was a four-year program, CMES in Grand Rapids, and Alpha in Grand Rapids. Alpha will expand its operations in several areas. Texarkana, apparently, will again go through the process of issuing an RFP and selecting a contractor for next year's performance-contracted program.

It is not likely that any of the contractors involved in the programs in the Rand sample enjoyed a high rate of return on their investments. This conclusion is a

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speculation, of course, since information on LSC costs is proprietary, but achievement gains were not sufficient to generate large bonuses and sizable development and managerial expenses were encountered. Rand's field study supports Sigel's conclusion that, "The rub is there's little profit, if any, in running programs with the amounts schools now spend."[19]

One of the leading contractors, Westinghouse Learning Corporation, with two programs in the Rand sample, has discontinued its participation in performance contracting. Other performance contractors have indicated to us that they are going to be more particular about the financial arrangements in future programs.

Performance contracting has not been an immediate bonanza, but it has been very rewarding for contractors in another way, having helped a number of firms in the education industry to break into new markets heretofore largely dominated by textbook publishers. The key to overcoming the barriers to entry was the LSCs' willingness to offer so-called "guarantees"—promises of refunds if achievement gains were not realized. Many LEAs have wanted more contractor involvement in implementing the systems they sell and more assurance of benefits if scarce education dollars are spent. The claim heard in 1970-71 that business was "trying to take over the classroom"[20] was somewhat off the mark. Disillusioned LEAs have generated much of the pressure for performance contracts. Many a dazzled or desperate school district has purchased equipment and materials because they were touted as wondrous, only to consign them to the attic, perhaps because they were ineffective, perhaps because the teachers did not use them properly. In any event, LEAs have wanted more follow-through and warranties for new systems, and at the same time many LSCs have been seeking opportunities to demonstrate their wares.

The mechanism of the performance "guarantee" fitted into both desires. From the contractor's point of view, the public exposure this year has made performance contracting ventures worthwhile (at least for some of them). It is also obvious that established firms are going to be less anxious than newcomers to use this technique.

In brief:

- Performance contracting does not seem to have generated large profits so far.
- Performance contracting has generated some follow-on programs, only some of which tie fees to student achievement.

[19] E. Sigel, *Accountability and the Controversial Role of the Performance Contractors*, Knowledge Industry Publications, Inc., White Plains, New York, 1971, p. iii.

[20] R. D. Bhaerman, "Accountability: The Great Day of Judgment," *Educational Technology*, Vol. 2, No. 1, January 1971, pp. 62-63; "Hucksters in the Schools: The Performance Contracting Phenomenon," *American Teacher*, Vol. 54, No. 1, September 1970, pp. 9-11.

- Established contractors tend to prefer other arrangements to performance contracting, such as consultantships. Performance contractors will seek to convert performance contracts to other types of programs.
- Performance contracts have enabled a number of firms to break into new markets and to receive publicity for their goods and services. Therefore, they will continue to be let.

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VIII. MAJOR ADVANTAGES AND DISADVANTAGES OF PERFORMANCE CONTRACTING

To summarize the foregoing discussions, we have consider the major advantages and disadvantages of performance contracting in education that can be inferred from our field work. The major advantages appear to be three:

- *Performance contracting facilitates the introduction of radical change in education.* Outsiders appear to be freer to implement new methods and materials than are regular school employees. In addition, small school systems cannot afford the capital investment required for initial research and development of new instructional approaches, which LSCs may be able to recoup by future sales.
- *Performance contracting places increased emphasis on accountability for student learning.* School administrators are faced with the requirement to define objectives for education, and at the least to understand the relationships among objectives, instruction, and the tools used to measure the effects of instruction. They have become more aware, also, of the cost of programs, and of the pressing need for the ability to gauge the various outcomes of a program against its costs—that is, to measure cost-effectiveness—which would be of great value for allocating resources and for estimating what levels of achievement future programs can reasonably be expected to attain. Contractors, likewise, have become involved in the use of the products they have so fervently promoted. They have had to cope with the logistic and managerial problems of adapting their products to actual school situations and

the realities of test selection and administration. They, too, have been made more accountable—more aware of the relationship between program cost and outcomes.

- *Performance contracting has brought new LSCs into the educational field.* This point has been made previously and need not be expanded here.

Three major disadvantages also seem evident:

- *Some performance contracting programs have been so complex that management has been severely hampered and costs have been unnecessarily high.* Complex contracts have been engendered by an attempt to contract for skills thought to be lacking within the district. Management support groups, independent evaluators, and educational auditors have all been used. The advisable solution to lack of skills seems to be to attempt to develop them within the district, rather than hire them ad hoc and piecemeal.
- *Performance contracting programs will probably continue to be narrowly focused because of difficulties of defining objectives in subject areas other than those involving simple skills or, in some cases, difficulties in measuring the attainment of objectives.* This point has also been sufficiently explored above.
- *Performance contracting has exacerbated old problems to the point where they almost seem to be new ones.* There have always been problems with managing new programs, but the inescapable need to provide a given number of instructional hours to a given number of students has highlighted start-up difficulties. In addition, writing RFPs, negotiating and renegotiating contracts, and resolving differences concerning lines of authority and responsibility, all become more crucial in a performance contract.

Special legal difficulties have arisen and are likely to become more severe in the future. Owing to the pressure of deadlines for getting programs adopted, organized, and launched, legal shortcuts were sometimes taken, education codes have been challenged, state-adopted textbooks discarded, and local laws violated. Since these illegalities can be used by opponents of performance contracting, LEAs and LSCs will continue to need legal help to forestall disruption of the programs.

Since most programs attempt to individualize instruction, they must lower costs by substituting materials, equipment, and aides for highly trained teachers. Doing so changes the role of teachers, who often become discontented or enter into outright opposition.

Finally, performance contracting has spotlighted the inadequacy of gain scores on standardized achievement tests as measures of the effectiveness of instructional

programs. More reliable and valid measuring instruments in a wider variety of instructional areas must be devised if performance contracting is to become a widely used tool in education.

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Appendix

PROGRAM AND RESOURCE INFORMATION

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GARY

Behavioral Research Laboratories

Characteristics of students	Grades K-6; black, lower-middle-class family; low transiency rate
Program scope	
Instruction	All subjects
Number of students	850
Class time	Entire school day
Class size	Variable
Number of sections	20
Facilities	
Space	Entire school
Students/classroom/day	Variable
Furnishings	Conventional
Staffing	
Certified teachers	5 curriculum managers (master teachers); 20.5 assistant curriculum managers (other teachers)
Special teachers	2 curriculum consultants
Aides	20
Other	1 program director
Equipment	No special equipment; 1 reading lab, operated mornings
Materials	BRL-Sullivan Project Read, Project Math; *Science: A Process Approach* (AAAS-Xerox); *Man: A Course of Study*; other standard Indiana texts
Pre-service training	2 weeks
In-service training	4 weeks plus continuing activities of 2 full-time consultants
Other support	None
Incentives	None

GILROY

Westinghouse Learning Corporation

Characteristics of students	Grades 2-4; Title I; low socioeconomic status
Program scope	
Class time	1.25 reading, 1.25 math
Class size	50 students per class
Number of sections	2
Utilization	5 hours a day
Number of students	103
Facilities	
Space	2000 sq ft; 1 classroom, 1 activity area
Furnishings	6 carrels, carpeting, tables
Staffing	
Special teachers	1 full-time-equivalent reading specialist
Paraprofessionals	2 per center, 1 per activity area
Equipment	Telex, tape recorders, cassette players, headset
Materials	Books, games, toys
Pre-service training	4 days
In-service training	1 week, total
Other support	Remote diagnostic and prescriptive
Incentives	25 per student--candy, scrip

GRAND RAPIDS

Alexander and Hall Schools
(Same for both schools)

Alpha Systems

Characteristics of students	Grades 1-3; inner-city black (Alexander); largely Latin American (Hall); low income; transiency 20%; lowest achievers
Program scope	
Instruction	Reading and math
Number of students	300 (100 each grade)
Class time	2-1/4 hours
Class size	150 in 3 rooms
Number of sections	2
Facilities	
Space	3 regular classrooms
Students/classroom/day	100
Furnishings	From regular program
Staffing	
Certified teachers	2
Special teachers	0
Aides	3
Other	1 full-time on-site director, shared[a]
Equipment	No special equipment; free room game equipment
Materials	Variety of programmed instructional materials (17% consumable); free room materials
Pre-service training	2 weeks on curriculum, behavior modification, contingency management, diagnosis and prescription
In-service training	4 days during year in lieu of regular district in-service
Other support	None
Incentives	None

[a]With West Middle School.

GRAND RAPIDS

West Middle School

Alpha Systems

Characteristics of students	Grades 7-9; inner-city racially mixed; low-medium income; transiency 20%; lowest achievers
Program scope	
Instruction	Reading and math
Number of students	300 (100 each grade)
Class time	110 minutes a day
Class size	100 in 3 rooms
Number of sections	3
Facilities	
Space	3 regular classrooms
Students/classroom/day	100
Furnishings	From regular program
Staffing	
Certified teachers	3
Special teachers	0
Aides	5
Other	1 full-time on-site director, shared[a]
Equipment	No special equipment; free room game equipment
Materials	Variety of programmed instructional materials (75% consumable); free room materials
Pre-service training	2 weeks on curriculum, behavior modification, contingency management, diagnosis and prescription
In-service training	4 days during year in lieu of regular district in-service
Other support	None
Incentives	None

[a]With Alexander and Hall Schools.

GRAND RAPIDS

South Middle School

Combined Motivation and Educational Systems, Inc.

Characteristics of students..... Grades 6-9; transiency 26%; black, model-cities neighborhood; low income; lowest achievers according to last spring's testing; special education pupils included; program pupils distributed among all homerooms

Program scope

No. of students (mid-December).. 491, reading; 535, math

Class time..... 45 minutes per day each, reading and math

Class size..... 35-40 in Single Center (SC) (40 optimum); 60-65 in Double Center (DC) (optimum)

Number of sections..... 14 each (7-period day)

Facilities

Space..... 4 centers: 1 DC for reading and math; 1 SC for reading and 1 SC for math; each center has an instructional and an AMS area; 1 reinforcement room; total occupies space of 7 former classrooms (walls were changed)

Students/classroom/day..... Number of enrollments/number of classrooms = (491 + 535)/7 = 147

Furnishings..... Table space for carrels; carpeting; air conditioning; 1 carrel per student per class (approximately 140 total); chairs

Staffing

Certified teachers..... 1 per center (i.e., 1 per SC, 2 per DC)

Special teachers..... 0

Paraprofessionals..... Full time: 1 per center, 1 for reinforcement room, 1 substitute

Other personnel..... 1 full-time director, 1 full-time secretary

Equipment

Primary unit..... Reading: 40 Hoffman reading machines; math: 40 tape recorders/center (80 total)

Supplementary system..... Reading: 25 tape recorders/center (50 total); math: 40 flashcard readers (Electronic Futures)

Redundant system..... 15 Borg-Warner System 80 for reading and math

Materials (10% consumable)

Reading..... 2 sets EPL tapes per center; 2 sets Hoffman materials (levels B to G) per center; workbooks

Math..... Math mini-system (tapes); workbooks

Reading and math..... 2 sets Borg-Warner materials (levels 1-8) per reading and math center (i.e., 4 complete sets); 1 notebook per student for compiling materials

Pre-service training..... 1 week on AMS in-depth training, 1 week going through materials

In-service training..... About 2 hours a week

Other support..... None; instructional program self-contained

Incentives..... None

GRAND RAPIDS

Franklin School

Westinghouse Learning Corporation

Characteristics of students	Grades 1-6; inner-city black; low income; transiency 30%; lowest achievers for first 5 months, then entire school (excluding most special education students)
Program scope	
Instruction	Reading and math
Number of students	Initially 100, later 150 (as of February)
Class time	Initially 2-1/4 hr, later reduced to 75 min for grades 1-4
Class size	45-55 (maximum at 60)
Number of sections	3 (1 each for grades 1 and 4, 2 and 5, 3 and 6)
Facilities	
Space	2 regular classrooms
Students/classroom/day	75
Furnishings	30 carrels and chairs, with electric outlets at each carrel; 7 tables, 21 chairs; 3 bookshelf-cabinets; carpeting
Staffing	
Certified teachers	1 (no planning time required)
Special teachers	None
Paraprofessionals	2, on 6-hour day
Other personnel	On-site director and secretary
Equipment	
Telex	1
Cassette tape recorders	30
Materials	BRL modern math texts; large variety of other materials
Pre-service training	5 days for all teachers of school
In-service training	8 morning meetings for entire staff
Other support	None
Incentives	None

NORFOLK

Learning Research Associates

Characteristics of students	Title I
Program scope	
Number of students	250
Class time	50 minutes
Class size	25
Number of sections	5
Facilities	
Space	Regular classrooms
Students/classroom/day	125
Utilization	87%
Furnishings	Air conditioning, pleasant environment; small, modern (partitions, file cabinets, storage cabinets, etc., loose tables, chairs)
Staffing	
Certified teachers	1 per classroom
Special teachers	0
Paraprofessionals	1 per classroom
Other personnel	1 program director
Equipment	6 cassette players ($25), 6 tape recorders ($150), earphones ($50)
Materials	Sound filmstrip sets; cassettes; workbooks and miscellaneous supplies, books, kits
Pre-service training	1 week
In-service training	3 days
Other support	Evaluation--$10 per child
Incentives	300 paperback books given as awards

NORFOLK

Remedial Program

Characteristics of students	Title I
Program scope	
Number of students	1000 (14 elementary centers, 60 students per center; 3 junior high centers, 50 students per center
Class time	50 minutes
Class size	10
Number of sections	6
Facilities	
Space	1/2 regular classroom size
Students/classroom/day	60
Utilization	80%
Furnishings	File cabinet, loose tables, chairs
Staffing	
Certified teachers	1 per classroom
Special teachers	0
Paraprofessionals	0
Other personnel	1 program director
Equipment	Language Master
Materials	Books, filmstrips, games, kits
Other support	Diagnostic center: $35,000 (3 diagnosticians, 1 aide, 1 clerk, consumables)
Incentives	None

TEXARKANA

Dorsett Educational Systems, Inc.

Characteristics of students.....	Grades 7-12; educationally disadvantaged (at least 2 years below grade level); IQ at least 75
Program scope	
Number of students.....	350, reading and math
Class time.....	1 period math, 1 period reading
Class size.....	20 students per classroom area
Facilities	
Space.....	4 trailers, each 900 sq ft; 2 classrooms, each 1000 sq ft
Utilization.....	100 percent
Furnishings.....	Desks, carpet, air conditioning
Staffing	
Certified teachers.....	1 per center
Special teachers.....	0
Paraprofessionals.....	1 per center
Other personnel.....	Project manager
Equipment.....	Dorsett M-86 Teaching Machines
Materials.....	Filmstrips, records, programmed texts
Pre-service training.....	8 days per teacher
In-service training.....	No formal training
Incentives	
Students.....	Green Stamps, transistor radios, 1 TV, some popular records (and player), games, puzzles, popular magazines, free time
Teachers.....	Dorsett stock bonus and options

TEXARKANA

Educational Development Laboratories

Characteristics of students	Grades 7-12; educationally handicapped (at least 2 years below grade level) IQ at least 75
Program scope	
Number of students[a]	251, reading; 261, math
Class time	1 period math, 1 period reading
Class size	20 students per classroom area
Facilities	
Space	4 trailers, each 900 sq ft; 1 classroom 1000 sq ft
Utilization	100% (6 hours a day)
Furnishings	Desks, carrels, carpet, air conditioning
Staffing	
Certified teachers	1 per center
Special teachers	0
Paraprofessionals	1 per center
Other staff	Project manager
Equipment	EDL Aud-X, Tach-X, Controlled Readers, Flash-X
Materials	Filmstrips, cassettes, cards with magnetic strips
Pre-service training	40 hours per teacher and aide
In-service training	No formal training
Other support	None
Incentives	None

[a]Model Cities funded 110 6th-graders for the same instructional program, giving a total program of 395 students.